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ORANGE COUNTY AMATEUR RADIO CLUB
P.O. Box 95, Orange, Ca. 92669

Volume XII No. 9

November 1971

- MEETING -

November 19, 1971 - 7:30 PM

| | | |
|------------|-------------------------|----------|
| Pres: | Bill Hall - WB6CQR | 638-0101 |
| V. Pres: | Ken Konechy - W6HHC | 541-6249 |
| Sec: | Ron Cade - WA6FIT | 897-8059 |
| Tres: | Bill Robinson - WB6WOO | 542-7958 |
| Activity: | Bob Eckweiler - WB6QNU | 639-5074 |
| T.V.I.: | Roger Coul - WA6AAL | 541-8348 |
| Mem.: | Don Gould - W6EQY | 821-8518 |
| Pub. Rel: | Jack Shaw - WA6YWN | 633-8742 |
| M/A/L: | Jerry Verduft - W6MNY | 542-5827 |
| | Jack Hollander - WB6UDC | 544-5369 |
| R. F. ED.: | Richard Nelson - WA6OBM | 557-6614 |

OCARC ACTIVITIES (see page 9)

MEETING - 3rd Friday each month, 7:30 PM, in basement of Lincoln Savings Building, 17th St. & Bristol in Santa Ana. Guests and visitors welcome.

BREAKFAST in Santa Ana. Guests and visitors welcome.
1st Saturday each month, 8:30 AM, at Mannys
Restaurant, 17 th street near Newport Fwy.
in Santa Ana. Meets in back of room.

15 M Net Club Station W6ZE, meets every Thursday at 21.375 (\pm QRM) MHz. at 8:00 PM. All Amateurs welcome to check in. Club and ARRL Bulletins read. At least SWL for info.

OCARC "RF" NOV 71

MINUTES OF OCTOBER OCARC MEETING

The October meeting of the OCARC was called to order by V.P. Ken Konechy, W6HHC, at 7:47 PM. Ron, WA6FIT, introduced the club officers to the members and guests attending. Bill, WB6WOO, gave our monthly treasurers report which was \$664.61. Ron, WA6FIT, gave a short post convention report. Ric, WA6OBM, requested material for "RF" to be submitted by the first Friday of the month for inclusion in the months edition. Break for coffee. Program for the evening was presented by Ken, W6HHC, on digital logic functions and circuit applications. Useful notes were given to the members for future reference. Raffle.

Cheerfully submitted by:
Ron, WA6FIT

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MINUTES OF OCARC OCTOBER BOARD MEETING

A board meeting of the OCARC was held at Bill Halls residence on October 26, 1971. Members attending were: WB6CQR, W6HHC, WA6FIT, WB6WOO, WB6UDC, WA6OBM, and WB6TBU. The Board:

- a. approved sending a "job well done" letter to Bill Johnson for his efforts on the convention.
- b. was informed that a check for \$600.00 was received as proceeds from the convention.
- c. listened to the treasurers report of \$ 1,264.61.
- d. decided that the dues remain \$ 6.00 per year.
- e. discussed a program for encouraging OCARC members to up grade their licenses.
- f. passed a resolution to spend \$ 15.00 for a stapler and staples for processing "RF".
- g. recognized the near impossibility of recovering the old badge blanks and will continue having the

BOARD MINUTES CONT'D

- g. cont'd. present design available to the membership
- h. was notified that the Lincoln Savings and Loan Building will be locked and the president or his representative must pick up the key during the day prior to the meeting.
- i. as per custom asked Ken, W6HHC, to make arrangements for the Christmas dinner which will be held on December 17, 1971. The program will include dinner, gift exchange, presentation of raffle, and caroling. The dinner is to be a family affair and children under 12 are to be guests of the club.
- j. discussed officer nominees for 1972 officers. The slate offered:

| Office | nominee | call |
|------------------|--------------|--------|
| President | Ron | WA6FIT |
| Vice President | Bob | WB6QNU |
| Secretaty | Ric | WA6OBM |
| Treasurer | Frank | WB6TBU |
| Activity | UP FOR GRABS | |
| T.V.I. | Bill | WB6WOO |
| Public Relations | Lee | WB6FKD |
| "RF" Editor | Ric | WA6OBM |
| Membership | Ernie | WB6VOV |
| Members at Large | Bill | WB6CQR |

Submitted by Ron, WA6FIT.

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BITS AND PIECES

Jack, WA6YWN, reports that Bob, W6KFF, who was formerly was with Heathkit and has presented several programs to the OCARC is now working for RCA.

The stars are in favor of K6LJA winning a prize at the SAROC convention.

A HOT NUMBER

What happens when a frying pan sits empty on a hot stove? Obviously if it stays there long enough it will "burn up". A similar situation exists when a fellow ham asks you for 60 seconds of tone so he can rotate his antenna for a check. Oh those finals. The problem is to remove heat from the tubes to prevent their temperature from increasing to a destructive level.

It is important to understand the difference between heat and temperature. Heat may be compared to current and temperature to voltage in an electrical comparison. A high heat may or may not cause a high temperature. It is the purpose of this article to discuss the various means used to keep the temperature of an object below destructive levels. It is not a technical dissertation on heat sinking.

Going back to the heating frying pan, suppose it took five minutes to heat to a smoking temperature. Now suppose the frying pan was full of water. It would take a longer time for the frying pan to reach the same temperature. First the water has given the pan a larger thermal mass. Because the pan and water conduct heat the whole combination must increase in temperature together and absorbs a greater amount of heat and will take a longer time to reach a given temperature. Second, the water would start to boil and even more heat would be absorbed by the water because it takes additional heat to convert a liquid into a gas even though the temperature is the same, i.e. 212° F. steam or 212° F. water.

Heat moves from a high temperature to a lower temperature. The result is that the source is lowered in temperature and the object being heated is raised in temperature until they are both at the same temperature. Heat moves by three basic means; conduction, convection, and radiation. Conduction occurs when heat travels through solid and liquid objects. Convection occurs when heat travels through gasses, and radiation when heat travels through a vacuum. All of these means are used to move

heat from a heat source to an area, usually the surrounding air, where it can be easily absorbed.

As an example for this investigation of cooling imagine a power transistor generating so much heat that if sitting in the air it would soon reach a temperature which would destroy the device. How can it be cooled?

1. The first approach would be to blow air on the transistor. This would cool it down and forced air cooling is commonly used for cooling electronics equipment and components.
2. Next the transistor could be mounted on a solid conductor which would move the heat from the transistor to the surrounding air. A heat sink results. Additional cooling could be obtained by forced air.
3. A heat sink with forced air is expensive and a means to increase the flow from heat sink to air without the fan or blower is desirable. The staggered finger design is a remarkable improvement over "regular" heat sinks. The staggered fingers cause a turbulence near the surface which increases air movement and greater heat flow.
4. One of the problems encountered with metal heat sinks, usually aluminum, is that the metal is also a good conductor of electricity. A material that conducts heat very well, is also a good electrical insulator, and has low R.F. loss would make an excellent heat sink and has long been sought in research laboratories. Beryllium Oxide in its very pure form meets these requirements and is being used in many shapes for cooling while electrically insulating. If copper has a relative conductivity of 100, aluminum would be 55, silver 105, and high purity beryllium oxide 62. Better than aluminum! As an insulator the resistivity of high-purity beryllia-the term used for the general class of beryllium oxide ceramics - is so high it hasn't been precisely measured yet and exceeds 10^{16} ohm-cm at room temperature. Used for transistor packages, heat sinks for tubes, substrates for hybrid circuits, and insulating spacers replacing mica, beryllia is truly a remarkable material. It is still expensive and its dust is poisonous, but more and more it is being found in electronics components. Diamond also exhibits

the same properties as beryllia. Diamond heat sinks anyone.

5. Another means of cooling the transistor is by use of a heat pipe. The transistor could be mounted on the end of a closed pipe which would conduct heat down the pipe to a heat sink at the other end. The heat pipe uses a low boiling liquid inside and is lined with a capillary wick which allows liquid to flow from the heat sink back to the heat source (our transistor). The liquid boils and the process of changing from a liquid to a gas absorbs heat. The gas moves readily to the heat sink where it cools back to a liquid to return back to the heat source in liquid form. It is sealed and extreamly efficient and heat pipes up to three feet long are available commerically. The temperature drop along the heat pipe is a few degrees per foot.

6. A recent method of moving heat uses an electrostatic field (Electrostatic cooling) produced by connecting the positive of a high voltage D.C. supply to the object being cooled and the negative to a pointed electrode near the heat source. (a few inches) About 7 K.V. is fine and currents of up to 100 ua is adaquate. This cooling technique is not fully understood, but it is suggested that the high voltage corona causes greater air movement and increased transfer of heat from solid to air. A recent test was conducted which demonstrated that a 14 watt fan lowered the temperature the same amount as 3 watts of "corona" cooling.

This article has covered only a few approaches of heat transfer. Vapor cooling, thermo-electric cooling, and other schemes have also been used. The new tubes being advertised such as the Eimac 8828W use Beryllia heat sinks (with chassis) which makes a truely quiet linear. The next time you see a vacuum tube bolted to a chassis like a transistor, remember beryllia is what insures that it won't become a hot number.

There will be a box of pieces of beryllia on the table at the next meeting. Take a piece and while holding it in your fingers place a match under the other end.

2 METER VERSATILE ANTENNA

Figure 1 shows construction details for a 2-meter antenna (cost about \$ 2.00) which can be used as a mobile whip or can be "plugged" directly into your transceiver for portable operation. If you're going to make one, maybe Richard Nelson will let you have two of the little cans which greatly simplify construction and make the finished product look quite professional.

The first step in making the antenna is completion of the upper section which includes the antenna, the 5/16" brass bolt insulated from the can and the coil which is soldered between the bolt and the can. Resonance and feedpoint impedance are found simultaneously by use of a grid dip meter, impedance bridge and a feedline which is a multiple of 1/2 wave in "electrical" length. The feed line should have alligator clips at one end and coax connector at the other. By clipping one lead to the can (ground) and the other to the coil about one turn away from the bolt (feed point), you'll be able to check resonance and experimentally find the proper feed point. (If you want to skip the "tuneup" procedure, it should be fairly close if you carefully follow the directions). The next step is to mount a connector to the bottom can and connect a lead from the center conductor to the feedpoint on the coil. Final check of SWR can be made with the cans temporarily taped together and by inserting the SWR meter between the antenna and transmitter. If the SWR is 1.5 or 2, you're in good shape. Clamp the two cans together and solder all around.

The finished product will perform about like a dipole, is small, light weight, is fitted with a coax fitting which can easily support the antenna for direct coupling to the transmitter or transciever, is inexpensive, looks good, and is fun to make.

Good luck, 73's DE WB6WOO

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Ed. Note. I have a large supply of the 1" x 1" x 1" cans and will bring a few to the meeting if anyone needs any.

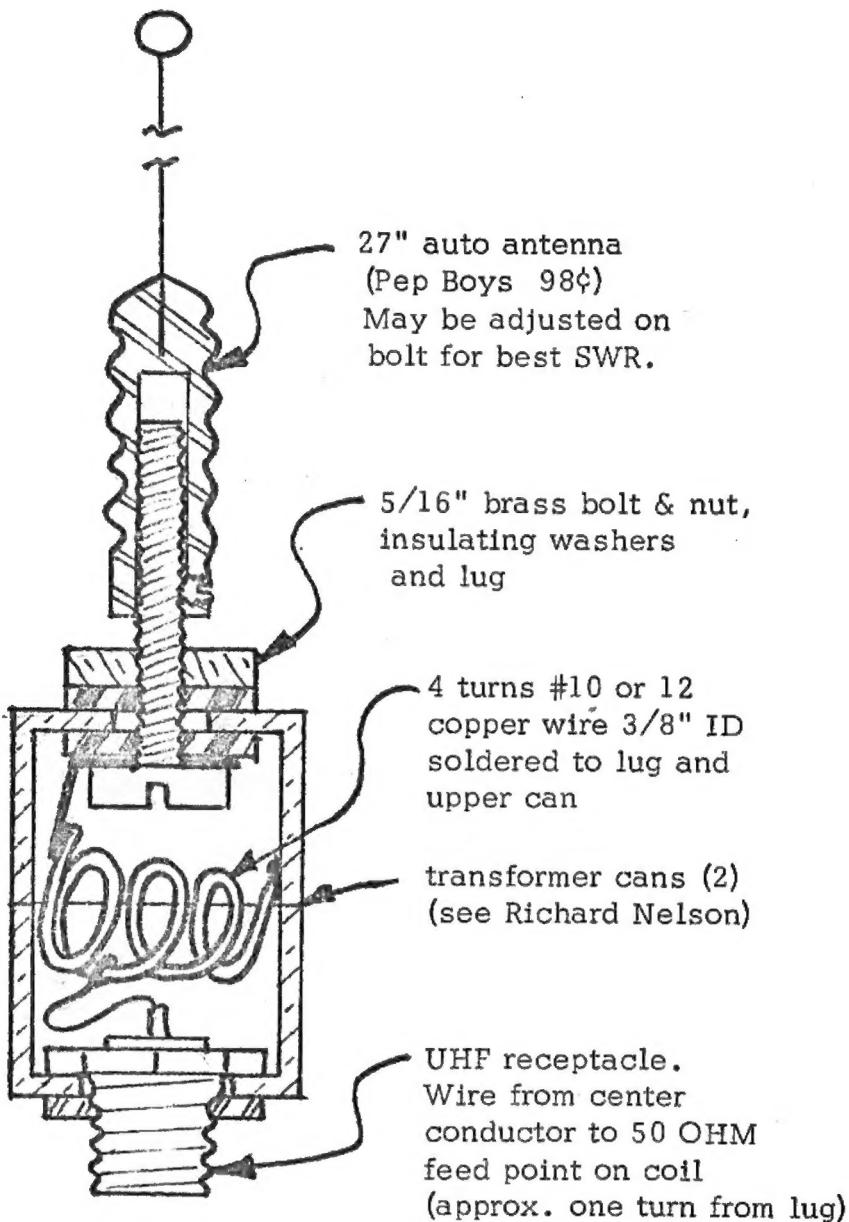


FIGURE 1.

CHRISTMAS DINNER

Two choices are available for the Christmas dinner. The first is Renardos, on Harbor in Fullerton. The club had their dinner there last year. The date would have to be on December 16. Six entries are available, with the whole club having to select the same. The cost varies, but averages about \$ 3.50 per adult. Roast Beef, Pepper steak, Roast Chicken, Ground N.Y. Steak with mushroom sauce, shrimp. Of course soup, salad, vegetables, spaghetti, and apple and cheese.

The second choice is the Horn of Plenty on Fairview in Santa Ana. The day would have to be Friday December 17. Cost would be about 2.90 per adult. Five or six entries would be available, but no prior selections. The advantage of the Horn of Plenty is the variety of food and a greater freedom of what and how much of what is offered. See the October board meeting minutes for the suggested program of this event. Ken will have detailed information on hand at the meeting so that the club can decide on which night and location that the Christmas dinner can be held.

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BITS AND PIECES CONT'D

Santiago Communications is providing communications for the world championship outboard motor boat races at Lake Havasu on November 27 and 28. Two meter FM and AM operators, with portable equipment if possible, are needed. If interested in an exciting weekend contact Bill Robinson, WB6WOO at 542-7958.

Reading "RF" Solve this puzzle by giving the coded word with your name on a piece of paper to the club secretary for a special prize worth \$ 5.00. On each page listed below is a word which is underlined every other letter. The letter of the word which corresponds to the page number upon which it is found will make the coded word if arranged in page order 3,1,2,4,5,7.

WD6WD QSL cards are printed and being mailed

Do you believe that every meeting should have a program no matter how short?

BITS AND PIECES CONT'D.

Paul, WB6TDO won the first Orange County T-Hunt of the month with a mileage of 40.1; second mileage being 42.5. Paul is active in the 2M T-hunts which uses Panarama Heights (Tustin?) as a starting point at 8:00 PM every other Saturday evening. Next hunt is November 20, 1971. Where is TDO going to hide the TX and will SYC find it?

An informal gathering of 40 M mobile rag chewers happens at noon on Mondays at the Snack Shop. It is rumored that W6COJ, K6VIC, WA6YWN, K6LAT, and K6LJA have been known to drop by. The RF roaming reporter says that any hams with 40 M mobile interest are invited.

Sam, maybe you moved? let us know at the next meeting. Also we miss your UHF DX reports. Whats happening?

Last month a Santa Ana Amateur applied for a building permit to erect an Amateur Radio Tower. The permit was given, the tower was inspected twice (forms, holes, and a final) and it is now installed and approved. One interesting aspect about this application was that the guy supports were not as recommended by the tower manufacturer. The yard was not large enough to allow the full base spacing between tower and guy supports (anchors) so a five foot pipe was used. Using a pipe also makes for a safer installation as all guys are above neck level. For 2,200 lbs pull for a 56' three guy tower with 11 sq. ft. of antenna a 4 inch dia. pipe is required. This appears large to most hams, but remember that a lever five feet long with 2,200 pounds horizontal pull on it must withstand a tremendous moment. Also special precautions were taken (recommended by city engineer) to use garage as one anchor point. A steel bracket weighing 75 lbs was used in the final design. It was secured with 5/8" machine bolts 7" long. Steel straps were used to tie the wall together as well as a 4' x 8' plywood sheet. The plywood sheet (1/4") was used to make the wall a shear panel. The steel bracket was a 24" x 28" x 3/8" steel plate bolted to the inside of the garage door header. A 1 1/2 x 2 3/4" x 32" steel arm was welded to the plate and extended through the roof.

The Orange County Amateur Radio Club is a group of interested radio Amateurs formed to promote interest in and the advancement of amateur radio communications, as well as the field of electronics, to promote better relationships with the public, and to participate in all types of activities involving communications.

ORANGE COUNTY AMATEUR RADIO CLUB, INC.

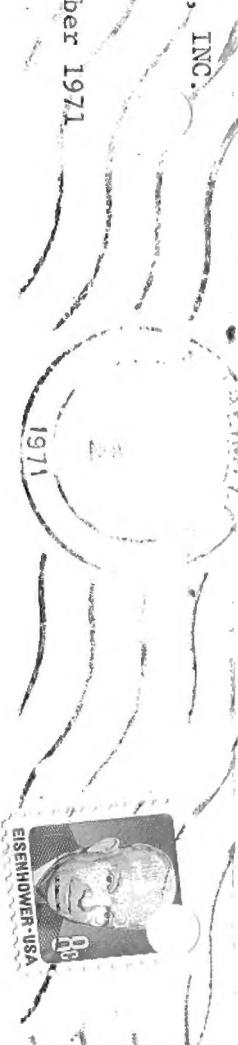
P.O. BOX 95

ORANGE, CALIFORNIA 92669

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First Class

Dated Material



Harlod Richards WA6BJO-28

18802 E. 17 th
Santa Ana, C.a. 92705